ASSESSMENT OF BUSINESS CUSTOMERS SATISFACTION WITH THE PRODUCTS AND SERVICE OF PNEVMOSTROIMASHINA, JSC, ON THE B2B MARKET

The global financial crisis revealed weaknesses of the domestic machine-building industry and had a negative effect on the Russian industrial enterprises. Thus, a sharp decline in demand for road-construction equipment from operating organizations resulted in stockpiling of this type of equipment in the manufacturers' warehouses. The financial difficulties caused by resection in sales led to reduction and even suspension of many productions. In turn, this trend influenced drop in demand for components, and, as a consequence, stirred up financial instability of assembler-producers.

Understanding of the need for reorientation of marketing activities by the owners and managers of industrial enterprises is another specific feature of the crisis. The main emphasis is put now on improvement of compliance with discerning taste and specific requirements of a particular customer rather than on maximizing profits. Drucker P., the management guru, wrote: «There is only one legitimate justification for conducting business: creating a satisfied customer» [1].

In the post-crisis environment companies are oriented to the problem how to retain the existing cus-
customers, attract new clients and effectively interact
with them at all stages of purchase: from producing
in accordance with individual requirements to selling
goods and providing after-sales service. This is one of
the most challenging marketing issues. In case of b2b
markets, the mentioned problem can be solved by sat-
satisfaction level monitoring of the key customers.

Despite the fact that a lot of works by Russian
and foreign authors are devoted to the aspects of
customer relationships, many statistical methods
for measurement of customer-supplier interaction
efficiency were developed; but so far there is no ef-
fective tool for assessment of customer satisfaction
with product quality and service level. The problem
of measuring customer satisfaction is still not studied
well.

A theoretical background
for customer satisfaction analysis

There is a variety of methodological approaches
to evaluation of customer satisfaction with con-
sumer goods and industrial products. Different al-
gorithms, methods and rating scales are proposed.
Meanwhile, a few studies are devoted to develop-
ment of a universal methodology for customer sat-
satisfaction assessment.

In the majority of methodological approaches re-
spondents are required to evaluate products, services
and business performance according to a number of
criteria. Thus, in 1995 Carter R. advocated a com-
prehensive approach to supplier selection by a cus-
tomer. This approach is known as “Carter’s 10 Cs
for supplier selection” [2]:, namely: Competence: all
staff, all the time requires evidence; Capacity: suf-
sicient and flexible; Commitment: to quality —
quality systems; Control: control of the process;
Cash: sufficient funds for the business; Cost: cost/
price relationships and total cost of ownership;
Consistency: consistent production of goods or ser-
vices; Culture: compatible with similar values; Clean:
environmentally sound, conforming with legislative
requirements; Communications: a supplier is fully
integrated with information and communication
technology.

One of the most popular approaches is the model
of three levels of satisfaction by Kano N. (1980), in
which customer satisfaction depends proportionally
on a level and type of product quality [3]. Expected
quality of goods is characterized by what might en-
courage or induce the purchase. Desired product
quality implies that in case the product is improved,
the satisfaction level will increase. Attracting or
exciting quality of the product represents an unex-
pected level of service. In such cases, customers are
agreeably surprised, delighted and even stunned.
Moreover, the exciting quality soon turns into the
expected.

Lamben J.-J. offers an overall assessment proce-
dure for measurement of a level of satisfaction or dis-
satisfaction [4]. It is based on the concept of multi-
attributive model and includes three stages: first, an
average value of overall satisfaction with a product
or service is calculated; second, an average value of
satisfaction and importance for each characteristic is
measured; finally, assessment of intention to repeat
transaction is carried out. In order to determine the
level of satisfaction for the most important charac-
teristics, which impact the consumer choice, the ra-
tio of satisfaction / importance is assessed.

The Gap model, developed in 1985–1991 by
American researchers Parashuraman A., Zeit-
taml V.A., Berry L. L. offers to measure customer
satisfaction with service by analyzing the gap be-
tween expectations and actual level of services ren-
dered. Gap means excess of consumer expectations
in the assessment of services received [5-6]. The Gap
model allows understanding the process of rendering
services in general, identifying a possible source of
poor quality of the given services.

The Likert Scale, proposed by Likert R. in 1932,
and to another critical position, such as “completely
satisfied”, “to some extent satisfied” etc. Each cri-
terion has a rating scale. [7]. The given approach is
simple but unreliable because it does not take into
account the importance of criteria for customers
when evaluating a company’s performance. This
makes it difficult to identify the scopes that require
urgent improvement to a customer’s perspective.

The study conducted by Mittal B. and Las-
sar V.M. shows that dissatisfaction guarantees un-
loyalty, while only total satisfaction provides loy-
alty [8]. Therefore, overall customer satisfaction
is a significant factor in creating loyalty, which re-
quires regular monitoring of consumer satisfaction
dynamics.

In the literature, practical application of the
above models is reflected more independently of
each other, that substantially limits comprehen-
sive understanding of a customer satisfaction level.
Moreover, according to the majority of methods, a
customer satisfaction level is evaluated only based
on parameters of product quality or service level that
is not enough for qualitative assessment of customer
satisfaction and a detailed analysis of customer feed-
back. Combining different approaches allows con-
ducting a more detailed analysis.

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A methodical approach to measure customer satisfaction

The authors’ method is based on theoretical approaches by Lamben J.-J., Parashuraman A., Zeitaml V. A. and Berry L. L. As a research tool of the methodology a five-point Likert scale and the Gap model are used.

The authors suggest an organizational mechanism to conduct a research of customer satisfaction with industrial products. It includes several stages.

Stage 1. To set a survey goal, which may consist in identification of critical factors causing drop in product demand; definition of customers’ expectations in order to maintain a leading position on the market; customer segmentation according to certain indicators, and so on.

Step 2. In cooperation with all the company’s departments to elaborate a list of criteria, which are important for a customer as well as for a producer and evaluation of which allows achieving the research goal. Taking into account specific features of industrial products and customers’ behavior regarding product selection and buying process, the authors suggested including two types of parameters in the questionnaire. The first group consists of the product quality parameters: compliance of a product’s technical characteristics with the customers’ requirements; adequacy of the product life span; packaging quality and reliability (ease of opening, warehousing, storage); warranty period. The second group includes service level parameters: supplier reliability and stability; supplier contract performance; delivery time; convenience of cooperation with the manufacturer’s Sales department and/or its trade representative (calls frequency, accessibility, efficiency, professionalism); quality, adequacy and convenience of technical documentation; quality and speed of warranty service and repair; possibility of obtaining technical and design consulting (availability, frequency of complaints, sufficiency of consulting, efficiency, professionalism); frequency and quality of information on new product types.

Stage 3. To prepare a database of companies responding.

Stage 4. To work out a questionnaire: to formulate questions, chose a rating scale.

Stage 5. To send questionnaires to personal respondent companies by fax or e-mail. To keep track their routing in the responding companies.

Stage 6. To perform an analysis based on the questionnaire data collected, and to evaluate customer satisfaction with the product quality and service level.

In case of industrial customer analysis the authors suggest the respondents are divided into two groups: customers of primary and secondary markets. The former group includes manufacturing companies or OEM companies, which purchase industrial products for further use as components in their product manufacture, the latter consists of reselling companies.

The authors’ method of industrial customer satisfaction assessment is presented in Table 1.

The authors introduced the formula for assessment of satisfaction with a service level and offered to measure overall customer satisfaction, which marks the customers’ opinion about the products and services (S1). Previously, only product quality parameters were studied and calculated. The authors refined upon the methods by reducing the list of questions in the questionnaire; simplifying question wording; including open-ended questions; setting a rating scale. Moreover, the authors analyzed customer satisfaction in the context of product types; tracked satisfaction dynamics in all the surveyed companies and systematized the mechanism for data collection and processing.

The given technique is applied for Pnevmostroimashina, JSC. The changes in the assessment procedure introduced by the authors have improved the customer research model previously used at the enterprise. In accordance with the findings of the customer satisfaction research held in 2009, the authors provide some recommendation. First, it is recommended that the assessment technique was introduced in the companies of JSC Pnevmostroimashina distribution network in order to study end-users of the company’s products. To increase involvement of the company’s departments in achievement of the common goal to strengthen partnership with customers and gain profits, the authors offer to bring the research results to the management notice and use them in the work of all the departments. In order to increase respondents’ motivation to fill in the questionnaires and to get customer feedback, it is recommended that a written notice on the activities developed and approved for execution on the basis of the questionnaires was sent to the customers.

“Pnevmostroimashina” JSC performance in the machine-building industry

JSC Pnevmostroimashina is the Russian leading manufacturer of hydraulics and Russia’s and CIS countries’ largest supplier of hydraulic components for domestic manufacturers of road construction equipment: excavators, loaders, rollers, cranes, graders, asphalt pavers, concrete mixers, as well as municipal machines and combine harvesters.
### Method of industrial customer satisfaction assessment

#### Table 1

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Stage: formula</th>
<th>Rating scale, maximum indicator value</th>
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</thead>
<tbody>
<tr>
<td>1. Analysis of the primary market customers (PM)</td>
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<tr>
<td><strong>1.1 Rating of criteria importance when selecting a supplier</strong></td>
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<tr>
<td>$I_{PM}$ — importance indicator for the primary market customers</td>
<td>$I_{PM} = \frac{\sum P}{n}$ (1),</td>
<td>One-to-five scale is used, 5 — very, 1 — of no importance. Maximum indicator value equals to 5 points or 100%</td>
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<tr>
<td>$P$ — criterion, $n$ — number of respondents</td>
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<tr>
<td><strong>1.2 Rating of product and service criteria satisfaction</strong></td>
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<tr>
<td>$S'_P$ — customer satisfaction with the product quality ($PQ$)</td>
<td>$S' = \frac{\sum P_{PQ1}}{n} + \cdots + \frac{\sum P_{PQ4}}{n} \cdot 100$ (2),</td>
<td>Scale of one to five is used, 5 — excellent, 1 — poor. Maximum indicator value equals to 5 points or 100%</td>
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<tr>
<td>$P_{PQ1}, \ldots, P_{PQ4}$ — product quality criteria, $n$ — number of respondents</td>
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<tr>
<td>$S'_S$ — customer satisfaction with the service level ($SL$)</td>
<td>$S' = \frac{\sum P_{SL1}}{n} + \cdots + \frac{\sum P_{SL8}}{n} \cdot 100$ (3),</td>
<td>Scale of one to five is used, 5 — excellent, 1 — poor. Maximum indicator value equals to 5 points or 100%</td>
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<tr>
<td>$P_{SL1}, \ldots, P_{SL8}$ — service level criteria, $n$ — number of respondents</td>
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<tr>
<td>$S$ — customer satisfaction with the product quality and service level</td>
<td>$S = \frac{(S' + S')}{2}$ (4)</td>
<td>Scale of one to five is used, 5 — excellent, 1 — poor. Maximum indicator value equals to 5 points or 100%</td>
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<tr>
<td><strong>1.3 Competitive supplier analysis</strong></td>
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<tr>
<td>$S$ — indicator reflecting customer attitude to the competitive suppliers’ products</td>
<td>$S = \frac{\sum (A + B)}{n}$ (5),</td>
<td>B criterion equals to 2 points, A criterion equals to 1 point. Maximum indicator value equals to 2 points or 100%</td>
</tr>
<tr>
<td>$A$ — a situation, when a customer buy the products from only one supplier, $B$ — a situation, when a customer buy the products from several competing suppliers; $n$ — number of respondents</td>
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<tr>
<td><strong>1.4 Defect analysis</strong></td>
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<tr>
<td>$S_{DP}$ — indicator reflecting a return quantity of products over a warranty period</td>
<td>$S_{DP} = \frac{\sum N_{V}}{V_{n}} \cdot 100$ (6),</td>
<td>Each criterion value corresponds to a certain number of points. Maximum indicator value equals to 5 points or 100%</td>
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<tr>
<td>$N_{V}$ — return quantity over a period; $V_{n}$ — purchase quantity over a period; $n$ — number of respondents</td>
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<tr>
<td><strong>1.5 Calculation of the primary market customers satisfaction</strong></td>
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<tr>
<td>$S_{PM}$ — overall satisfaction indicator of the primary market customers</td>
<td>$S_{PM} = S + S + S'$ (7)</td>
<td>Maximum indicator value equals to 5 points or 100%</td>
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<tr>
<td><strong>1.6 Gap analysis between customers’ expectations and satisfaction</strong></td>
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<tr>
<td>The gap discrepancy is calculated under every criterion</td>
<td>$C_{PM} = I_{PM} - S_{PM}$ (8)</td>
<td>To show the gaps between customers’ expectations and satisfaction on a graph.</td>
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<tr>
<td><strong>2. Analysis of the secondary market customers (SM)</strong></td>
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<tr>
<td><strong>2.1-2.6 The identical analysis of the secondary market customers is conducted</strong></td>
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<tr>
<td><strong>3. Analysis of the overall customer satisfaction indicator</strong></td>
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<tr>
<td>$S$ — integrated customer satisfaction indicator</td>
<td>$S = \frac{S_{PM} + S_{SM}}{2}$ (9)</td>
<td>Maximum indicator value equals to 12 points or 100%</td>
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<tr>
<td>$S_{PM}$ — overall satisfaction indicator of the primary market customers; $S_{SM}$ — overall satisfaction indicator of the secondary market customers</td>
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<td><strong>4. Development of measures aimed customer satisfaction growth; assigning people responsible for taking actions and setting deadlines</strong></td>
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In 2007, the company’s share in the domestic market amounted to almost 80%, in the global market it has 2.5% in the axial-piston hydraulics segment. One-fifth of the total sales are exported.

The company has widespread distribution and service networks in Russia and CIS countries: 5 trading houses, 9 distributors, 46 dealers; 15 sales representatives in CIS and non-CIS countries and 41 service centers. The products are exported to the Western and Eastern Europe, East Asia and Latin America.

According to the data of the Off-Highway Research consulting firm, amid the global financial crisis of 2008-2009 the Chinese, European, Indian, Japanese and North American markets saw a downward trend in demand for road-construction equipment that resulted in export reduction to these regions by 15% by JSC Pnevmostroimashina. Dynamics of demand for road-construction equipment in five major world markets is presented in Fig. 1.

According to data provided by the public organization “Russian Engineering Union”, in 2009 production of tractor, agricultural, forestry, road-construction and municipal machinery decreased by 49.1% as a result of a sharp drop in demand due to financial insolvency of buyers, payment delay, increased inventory in stock, difficulties in obtaining loans to ensure continuous output [9]. Import reduced significantly (Fig. 2).
Influenced by the negative effects of the economic crisis, the purchasing power of domestic road-construction equipment producers, which are the target customers of JSC Pnevmostroimashina, reduced significantly.

Table 2 shows the dynamics of the road-construction machinery production in Russia in 2006–2009.

Reduction in the output of the major road-construction equipment resulted in a five times drop of JSC Pnevmostroimashina production (Fig. 3).

To overcome the crisis and ensure competitiveness of domestic machinery producers on the Russian and global marketplace, it is required to develop and implement an integrated approach, combining development and introduction of modern technologies, to supply plants with high-technology equipment of the world leading producers, to conduct personnel training for establishing so-called “smart plants”. Machine-building ensures production saturation with new technical means and technologies and it is, ultimately, the main source of innovation development and further growth of the country [10].

The post-crisis industrial Russian market is characterized by the intensifying competition with the world leading machine-building companies, which establish their assembly plants in Russia. Under these circumstances domestic industrial enterprises pay more attention to customer research, development of individual technical solutions to meet the most demanding requirements. Development and implementation of an effective methodology for measurement of customer satisfaction will facilitate the work with customers and help to identify strong
Fig. 5. Gap analysis between expectations and satisfaction of the primary market customers, points

Fig. 6. Customer satisfaction levels on the primary market in December 2009, points
and weak points of an enterprise, which require improvement to enhance customer loyalty and increase market share.

**Customer satisfaction assessment at Pnevmostroimashina, JSC**

Road-construction equipment producers or primary market companies, as well as the distribution network entities or secondary market companies, are the respondents in the customer satisfaction survey held by JSC Pnevmostroimashina. The customer satisfaction analysis is conducted twice a year (in July and December) and consists of two parts: the analysis of primary market companies and the analysis of secondary market companies.

The authors have made calculations to assess primary market customer satisfaction with the product quality of JSC Pnevmostroimashina, and the analysis of values over the past three years that are presented in Figure 4.

Based on the results of the primary market customer analysis, the criteria are ranked in order of importance for the respondents and the gap analysis between customers’ expectations and satisfaction is conducted (Fig. 5).

An analysis of the gap between customers’ expectations and satisfaction discovered the fact that the high satisfaction criteria have high importance rating for the respondents. At the same time, the criteria requiring improvement due to the fact that their importance ratings exceed the satisfaction level, are identified.

Calculation of the average customer satisfaction indicator shows that 70% of primary market customers rate their satisfaction with products and services above average as shown in Figure 6.

The analysis of changes in the satisfaction level with product quality and service level by customers of the primary market for the last 3 years is shown in Figure 7.

In the 1st and 2nd half of 2009 the average customer satisfaction index on the primary market amounted to 9.41 points (78.38%) and 9.48 points (78.98%), respectively. The overall customer satisfaction index on the primary and secondary markets equals to 10.32 points (85.96%). The dynamics of the integrated consumer satisfaction indicator is shown in Figure 8.
Thus, heightened attention is paid to the needs and expectations of customers to meet growing customer expectations. Customer satisfaction becomes one of the most efficient marketing tools, capable of measuring efficiency of a company and predicting the way a company's market share may change depending on a current level of customer satisfaction.

When selecting ways to increase company's competitiveness, customer satisfaction, as well as customer expectations, product quality and service parameters are to be estimated.

Investigation of consumer satisfaction regularly executed by the specialists of the marketing department, allows upgrading technical characteristics of a product during its production and improving quality of service, thereby enhancing the company’s competitive position on the industrial market.

References


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Keywords: customer satisfaction, customer expectation, b2b market, industrial products, business customer, method of customer satisfaction assessment, service level, product quality, questionnaire, respondent, market research, criterion importance, customer satisfaction index, customer loyalty, OEM’s market, secondary market.